

REMARKS

The Examiner's understanding that the specified crystalline substances are precipitated during the heating process was correct. This aspect of the invention has been inserted into Claim 1 and conforming changes have been inserted into the other changes. As a consequence, it is respectfully submitted that the rejection of Claims 7 and 11 under 35 USC § 112, and the rejection of Claims 1-6, 8-10, 12 and 15-18 under 35 USC § 103 over Fukuta in view of Nishigaki have been rendered moot.

The sole remaining rejections are under 35 USC § 103 over Fukuta in view of Nishigaki and Hakotani, and possibly Nishigaki '066 and Martin. This rejection is respectfully traversed.

In a method employing "non-shrinkage processing", a green ceramic laminate is hardly sintered because the green ceramic laminate is sandwiched by constraining layers and substantially shrinks on in the thickness direction, and therefore the fluidity of contained glass tends to be inhibited. When the glass is one which precipitates a crystal phase and is contained in the starting material, the viscosity of the glass increases as the crystal phase become precipitated and thus the fluidity of the glass becomes lost. The consequence of this is that it is difficult to obtain a dense sintered ceramic. The present invention involves, inter alia, addressing this problem by specifying the rate of the temperature increase from the binder removal through sintering. The cited art does not teach or suggest the claim to process.

The Fukuta patent discloses a non-shrinkage process using constraining layers but does not teach or suggest the specified heating rate. The Hakotani patent teaches that mounting and interconnecting electronic components on a ceramic substrate and likewise fails to teach or suggest the heating rate. Thus the combination of these two references does not teach or suggest the claimed invention.

The Nishigaki patent relates to a method for manufacturing a low temperature fired ceramic in which a fireable ceramic material is shaped into green sheet and then converted to a dense fire ceramic product by rapidly firing inadequate air. The present invention seeks to achieve a precipitated crystal phase from the glass component which is forsterite, akermanite or diopside because these crystal phases have a small dielectric loss. As a result, the sintered ceramic has superior characteristics as high frequencies. No reference to achieving these crystalline phases has been found in this reference. In addition, Nishigaki is not concerned with a non-shrinkage process and no reason for combining reference with Fukuta is apparent. It is respectfully submitted that each of these reasons, standing alone, would be sufficient to overcome the rejection. And together, they make the rejection untenable.

Martin has been cited to show that certain glasses crystallize an akermanite-containing phase and Nishigaki '066 to show that certain glasses may (or may not) include impurities which may (or may not) include MgO. There is, however, no suggestion which would lead one skilled in the art to make the appropriate selections to realize a glass which precipitates akermanite and use it in the Fukuta process.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated: August 4, 2003

Respectfully submitted,

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